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PROCEDURE D-5-1
(FORMERLY APPENDIX A)

CALCULATING AND REPORTING UNCOMMITTED
RESERVE CAPACITY AT SEWAGE AND WATER TREATMENT PLANTS

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1.0 RATIONALE

It is the position of the Province that the number of lots in approved plans of subdivisions, developments committed by virtue of approved zoning, new official plans or site-specific official plan amendments, should not exceed the design capacity of the sewage and/or water system. In order to ensure that capacity is not exceeded it is necessary to determine what uncommitted reserve capacity is available. This procedure provides a means for determining uncommitted reserve capacity. As noted in Section 2.2.2 of the implementation guideline, if a municipality brings forward a specific proposal for alternative approaches for calculating and reporting uncommitted reserve capacity, the Ministry of Environment and Energy (MOEE) Regional Office will consider entering into alternative arrangements with the municipality.

Prior to calculating the uncommitted reserve capacity, it is important to recognize other factors which may limit new development, such as:

- limitations to the sewage collection/pumping stations (i.e.: basement floodings, overflow conditions, etc.);
- limitations to the water distribution system (ie: low pressure caused by small diameter mains), and other factors.

To this end, the "owner" is responsible for ensuring these factors, as well as any of the relevant plant performance characteristics listed in Section 3.2 below, are considered before calculating uncommitted reserve capacity for water and sewage works.¹

Plant performance and hydraulic capacity should be closely related to municipal growth management objectives in order to produce environmentally sound decisions regarding servicing. Municipalities should recognize that plant expansion or upgrades typically require a minimum of 3 to 5 years to develop, and should therefore plan for their long term development needs accordingly.

Municipalities should not recommend approval, and approval authorities should not consider approval, for development proposals if the uncommitted reserve capacity calculation has not

¹ The "owner" refers to the legal owner of the facility, or the person designated as owner in the Certificate of Approval for the works.

been prepared and submitted according to the principles set out in this document. Furthermore, if other factors which limit plant performance are not identified and addressed the application must be considered incomplete. MOEE is not able to process incomplete applications.

2.0 ROLE OF THE MINISTRY OF ENVIRONMENT AND ENERGY

MOEE, as the regulatory agency, is responsible for facilitating and promoting the compliance with the Environmental Protection Act, the Ontario Water Resources Act, and regulations enacted under those statutes. This mandate is fulfilled in part, through the issuance of Certificates of Approval, and based upon Ministry policies and guidelines. To this end, favourable comments from the MOEE on development proposals as they concern water and sewage treatment facilities, are contingent upon sufficient uncommitted hydraulic capacity and plant performance that is environmentally acceptable.

3.0 CALCULATING UNCOMMITTED RESERVE CAPACITY FOR SEWAGE AND WATER TREATMENT FACILITIES

In determining the uncommitted reserve capacity of sewage and water treatment plants, the following factors need to be considered: hydraulic capacity and plant performance in relation to environmental protection as set out in Ministry statutes, regulations and policies, and; the Certificate of Approval. Each of these matters must be considered by both the Municipality and the M.O.E.E. in assessing whether development proposals should be entertained.

3.1 Hydraulic Capacity

The uncommitted reserve hydraulic capacity should be calculated using the following formula:

$$C_u = C_r - \left[\frac{L \times F \times P}{H} \right]$$

C_u	=	uncommitted hydraulic reserve capacity (m ³ /d)
C_r	=	hydraulic reserve capacity (m ³ /d)
L	=	number of unconnected approved lots
P	=	existing connected population
H	=	number of households or residential connections
F	=	Defined under:

Sewage Treatment Plants

F = average day flow per capita
(m³/capita/d)

Water Treatment Plants

F = maximum daily flow per capita
(m³/capita/d)

Please refer to the definitions provided in Section 6.0 to assist you with this calculation.

NOTE 1:

The Formula accounts for industrial, commercial, institutional and other flows by means of the per capita flow figure which includes flows from all types of land uses and other flow sources such as infiltration. In certain cases, such as where there is evidence of seasonal population fluctuations, rapid growth and/or the existence of large industries, or in cases where per capita water or sewage flows for proposed new developments will be substantially different from historical flows, etc., the Regional MOEE Director may consider it reasonable and appropriate to modify the manner in which the calculation is completed. Municipalities are advised to consult their Regional MOEE office in this regard.

In order to provide additional protection against the design capacity of the systems being overcommitted, municipalities may choose to apply separate allocations for uses such as industrial plans of subdivisions, site-specific industrial uses characterized by high water consumption, existing vacant residential lots and similar examples that could significantly reduce the calculated reserve capacity by increasing the per capita flow figure.

NOTE 2:

In calculating the uncommitted hydraulic reserve capacity, municipalities should ensure that the variable "L" represents all unconnected servicing commitments including:

- vacant lots/units in registered plans of subdivision and condominium
- lots/units in draft approved plans of subdivision/condominium;
- the maximum development potential of lands (i.e. scale and density) as permitted under existing zoning;
- registered plans of condominium;

- vacant lots created by consent in serviced areas.

NOTE 3:

For Water Treatment Plants:

- Maximum day flows to be subtracted from uncommitted reserve capacity should be calculated on the basis of those increased max day flows at the treatment plant - as opposed to a max day flow calculated for the development. The latter would be an unrealistic representation of the impact of a small development at the treatment plant in a large community.

The following are examples of calculations for sewage and water treatment plants, using the above formula:

For Sewage Treatment Plant

Cr	=	12,000 m ³ /day
L	=	3,000 lots
F	=	.45 m ³ /day
P	=	25,000 people
H	=	8,000

$$C_u = C_r - \frac{L \times F \times P}{H}$$

$$C_u = 12,000 - \frac{3,000 \times .45 \times 25,000}{8,000}$$

$$C_u = 12,000 - 17,125 \text{ m}^3/\text{day}$$

For Water Treatment Plant

Cr	=	20,000 m ³ /day
L	=	3,000 lots
F	=	0.9 m ³ /day
P	=	25,000 people
H	=	8,000

$$C_u = C_r - \frac{L \times F \times P}{H}$$

$$C_u = 20,000 - \frac{3,000 \times .9 \times 25,000}{8,000}$$

$$= 11,562.5 \text{ m}^3/\text{d}$$

3.2 Plant Performance Characteristics Which May Affect the Use of the Above Formula

For Sewage Treatment Plants

The following performance characteristics may be used as a basis for imposing limited or long term development constraints:

- the treatment facility is in poor condition, performing erratically or not in accordance with its design;
- the effluent quality parameters exceed or are near the limits specified in the plant's Certificate of Approval;
- the sewage strength (i.e. organic loading) varies significantly due to industrial discharges into municipal sewers.

For Water Treatment Plants

The following performance characteristics may be used as a basis for imposing limited or long term development constraints:

- the existing treatment facility is in poor condition and not capable in meeting the maximum day demands, limiting pressures, etc.
- existing water quality does not meet health related parameters of the Ontario Drinking Water Objectives as stipulated in the plant's Certificate of Approval;

3.3 Compliance with Certificate of Approval

Municipalities are responsible for ensuring that they are in compliance with Environmental Laws and the Certificates of Approval issued for their plants. Certificates of Approval typically identify effluent limits which must be met. Non-compliance for effluent quality must limit development in the same way as insufficient hydraulic capacity.

Typical examples of limiting factors established in Certificates of Approval for sewage works which must be complied with are: biochemical oxygen demand (BOD), suspended solids and phosphorus.

In many cases the Certificates of Approval also specify additional parameters which require monitoring (e.g., ammonia)

depending on plant process. As a result, it is of critical importance that municipalities be aware of the specific requirements of their certificates. If the Certificate of Approval specifies a sampling protocol, it must be followed. If not, please refer to the MOEE policy entitled "Policy to Govern Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works (Liquid Waste Streams Only)" (MOEE Policy 08-06).

3.4 Policies of the Ministry of Environment and Energy

In addition to the requirements of the Certificate of Approval, there are a number of MOEE policies that govern the operation of treatment facilities (e.g. Ontario Drinking Water Objectives, Treatment Requirements for Municipal and Communal Water Works Using Ground Water Sources). This Ministry recommends that these policies be followed. Failure to comply with these policies may result in development restrictions imposed by this Ministry. Please refer to the addendum for a listing of the policies. For copies of these policies please contact the nearest MOEE Regional or District Office.

4.0 ANNUAL REPORT

Municipalities should produce an annual report within 90 days of the end of each calendar year, based on the calculation methods set out in this guideline. The annual report should address both hydraulic capacity and performance factors, and be retained by the municipality for a period of three (3) years. Under environmental legislation, these reports must be made available to Ministry personnel upon request.

The annual report must be authorized by an appropriate municipal official.² The date of the first annual report should be determined in consultation with the MOEE.

NOTE 4: Review and acceptance of an annual report by the MOEE should not be construed as confirmation of compliance with the requirements of the Certificate of Approval.

² "Appropriate municipal official" should be someone with credentials qualifying him/her to certify the capacity calculation as being a true and accurate reflection of the status of the sewage and water works. In an organized municipality, this would most likely refer to either the CEO or the Clerk.

5.0 IMPLEMENTATION

Each development application circulated to the planning authority should be accompanied by written certification, prepared by the appropriate municipal official, which indicates that uncommitted capacity is available and has been allocated to the development.

6.0 EXPLANATION OF TERMS USED IN CALCULATIONS OF HYDRAULIC CAPACITY

Sewage Treatment Plants:

Design Capacity:

The design capacity may be defined in the Design Report or in the Certificate of Approval. The components of the wastewater flow may include:

- domestic wastewater;
- industrial wastewater;
- inflow/infiltration;
- storm water.

Average Daily Per Capita Flow:

The average daily per capita flow means the total sewage flow to the sewage works over twelve (12) consecutive calendar months, or during the period of operation upon which the report is based, divided by the number of days during the same period of time. Yearly average day flows are acceptable if the effluent compliance criteria for the defined parameters is based on average yearly concentration and loading limits.

NOTE 5: The use of 3 vs 5 year records in establishing representative average daily flows will be determined by the MOEE Regional Director.

Hydraulic Reserve Capacity:

The hydraulic reserve capacity is defined as the design capacity minus the actual existing recorded average day flow.

Uncommitted Hydraulic Reserve Capacity:

The uncommitted hydraulic reserve capacity is obtained by subtracting the previously committed flows of registered and draft approved residential, commercial and industrial lots, from the existing hydraulic reserve capacity.

Commercial/Industrial Lots:

Sewage flows for commercial/industrial lots must be determined by the municipality. Municipalities should do this by estimating the water consumption / sewage figures for similarly sized, similar type developments and factor this information into the calculation of the uncommitted reserve capacity. Moreover, it should be understood that in some cases organic loading, and not hydraulic loading, may be the limiting factor.

In exceptional circumstances it is not possible to estimate water consumption / sewage figures, municipalities may estimate the flow with the prior approval of the Ministry. If the Ministry agrees that this is acceptable in the specific situation, the following approach may be used:

Industrial/institutional/commercial flows can be equated to an equivalent residential flow. A production/consumption rate of 100 gallons or 450 litres per capita per day of sewage flow or water demand should be used for designing sewage plants. This number will vary according to municipality. Once a specific industry is identified, the municipality will have a better indication of the amount of water the industry requires or the amount of sewage flows produced. The municipality will be able to determine whether its present sewage works can accommodate the industry.

Draft Approval:

Draft approved lots/units are those lots granted approval subject to certain conditions. These conditions must be fulfilled before the lots can receive final approval.

Draft approval is a commitment on behalf of the province and the municipality, and is interpreted by the proponent and the public as a reasonable assurance that development can proceed. Within a serviced municipality, the Province considers capacity to be committed to a development when draft approval is granted.

Water Treatment Plants**Design Capacity:**

Design capacity of water treatment plants is defined as quantity of water which can be delivered to the distribution system when operating the plant under design conditions and is sufficient to meet the maximum day demand. (Greater capacities may be required depending on in-system fire flow requirements and storage capacity). The design capacity of

water treatment plants can be obtained from the Certificate of Approval, Water Taking Permit, the design documents or design/operating manuals.

Hydraulic Reserve Capacity:

The hydraulic reserve capacity is defined as the design capacity minus the actual existing recorded maximum day flow. In some instances, the capacity of ground water supply wells or the perennial yield of the aquifer must be determined in order to calculate the hydraulic reserve capacity for municipalities provided by such ground water supply systems.

Uncommitted Hydraulic Reserve Capacity:

The uncommitted hydraulic reserve capacity is obtained by subtracting the equivalent flow commitments to registered and draft approved residential, commercial and industrial lots from the existing hydraulic reserve capacity.

Commercial/Industrial Lots:

Water consumption for commercial/industrial lots must be determined by the municipality. Water demands for commercial/industrial establishments vary greatly with the type of water-using facilities present in the development, the number of people using it etc. Industrial water demands will vary greatly with the type of industry i.e. wet or dry operations.

In exceptional circumstances, municipalities may estimate the flow with the prior approval of the Ministry.

Draft Approval:

Draft approved lots/units are those lots granted approval subject to certain conditions. These conditions must be fulfilled before the lots can receive final approval.

Draft approval is a commitment on behalf of the province and the municipality, and is interpreted by the proponent and the public as a reasonable assurance that development can proceed. Within a serviced municipality, the Province considers capacity to be committed to a development when draft approval is granted.

Maximum Day Per Capita Flow:

The maximum day per capita flow is based on the existing

maximum day flow divided by the serviced population. Lower maximum day flow figures may be accepted if the data indicates the highest flow(s) to the system occurred on an isolated basis, or where the municipality has successfully attempted to reduce leakage from the system and has also installed flow reducing devices.

As an alternative, the maximum day flow per capita may be derived by multiplying the average daily per capita flow with the maximum day factor. The maximum day factor is available in the design report or determined by using the design manual.

NOTE 6: The use of 3 vs 5 year records in establishing representative maximum day flow will be determined by the MOEE Regional Director.

ADDENDUM

LISTING OF MINISTRY OF THE ENVIRONMENT AND ENERGY POLICIES GOVERNING THE OPERATION OF TREATMENT FACILITIES

Guideline B-1:

Water Management - Goals, Policies, Objectives and Implementation
Procedures of the Ministry of the Environment

Guideline B-13:

Treatment Requirements for Municipal and Communal Water Works
Using Surface Water Sources

Guideline B-14:

Treatment Requirements for Municipal and Communal Water Works
Using Ground Water Sources

Guideline B-15:

Use of Pesticides In and Around Water Works

Guideline F-5:

Levels of Treatment for Municipal and Private Sewage Treatment
Works Discharging to Surface Waters

Guideline F-7:

Minimum Accepted Level of Servicing for Municipally and Privately
Owned Communal Systems

Procedure F-8-1:

Policy to Govern the Provision and Operation of Phosphorus
Removal Facilities at Municipal, Institutional and Private Sewage
Treatment Works

